

CASSIA IN NICARAGUA

Frank C. Seymour

In the course of identifying specimens collected by my companions and myself in Nicaragua in four expeditions between 1968 and 1972, it proved advisable to construct keys to various families and genera. In order to reduce the likelihood of overlooking some species or failing to give it adequate consideration, that seemed the best way.

Now and then one of the species collected had not been known previously in Nicaragua. The only published flora of Nicaragua, -- that by M. R. Goyena in two volumes in 1909 and 1911 respectively, -- was written so long ago that much progress has been made since then in the knowledge of the plants of Nicaragua. Copies of it are few and far between and usually unobtainable for reference. For these reasons it proved necessary to include in keys all the species known in all countries in Central America.

Such a key to Cassia having been constructed, why should it not be published? The sources on which the following key has been based are many. Specimens in several herbaria have been examined as indicated in the following list of species. The printed publications are numerous, of which the principal ones are listed in the bibliography at the end of this article. When anyone wishes to identify a specimen from Nicaragua, these herbaria and even the literature are not always available. Even if they are available, much time is consumed in consulting them. Therefore in the hope that it will be useful to others and save them the long labor which has been necessary to write this key and annotated list, the present paper is presented.

The genus, Cassia, is by some included in the family Leguminosae subfamily Caesalpinioideae: by others it is placed in a separate family, Caesalpinaceae. To characterize it briefly: leaves simply pinnate, with an even number of leaflets, 1-60 pairs. In many species, one or more glands borne between or below the lowest pair of leaflets. Petals nearly equal, usually yellow, imbricate in bud, the upper inclosed in the lower. Sepals nearly or quite distinct. Stamens 5-10, usually distinct, in some species not all fertile. Pods elongate, from flattened to terete. Plants, herbs, shrubs or trees, and sometimes between one or the other.

This key is frankly artificial. Whenever they are constant an effort has been made to use the characters which are most easily observed.

Distinctions based on whether the species is an herb or a woody plant are sometimes difficult. Not only may an herbarium specimen not show that character but some species are between herbaceous and woody (suffrutescent). For this reason, such distinctions have been subordinated.

In the latter part of this key, fruiting characters are most distinctive. However, for specimens which are not fruiting, a special key for the flowering stage has been provided.

ARTIFICIAL KEY TO SPECIES

- A. Petiole and axis of leaf without gland(s) B.
B. Leaflets acute or acuminate; plant a tree or shrub C.
C. Leaflets 4-15 pairs; tree D.
D. Leaflets 7-20 cm long, glabrous; sepals ovate or oblong 1. C. Fistula L.
D. Leaflets 3-7 cm long, finely hairy beneath; sepals orbicular 4. C. spectabilis DC.
C. Leaflets 2-3 pairs, 3-8 cm long, hairy beneath E.
E. Spines at base of stipules; leaflets wedge-shaped at base; sepals 5-9 mm long; shrub . . . 6. C. anisopetala Donn. Smith
E. Spines none; leaflets densely hairy beneath F.
F. Leaflets 3 pairs, 6-8 cm long, rounded at base, densely yellowish-hairy beneath; sepals 4-5 mm long 42. C. xanthophylla (B. & R.) Lundell
F. Leaflets 2 pairs, up to 15 cm long; fertile stamens 7; fruit terete; tree 8. C. oxyphylla Kunth var. dariensis (B. & R.) Schery
B. Leaflets obtuse or notched (retuse) at tip G.
G. Leaflets 6-20(-40) pairs; plant a tree or shrub H.
H. Sepals 10-15 mm long I.
I. Pod 4-winged, 1.5 cm wide; leaflets 3-8 cm wide, 6-12 pairs; petals prominently veined . . . 21. C. alata L.
I. Pod not winged, 1-2 cm wide, 7-15 cm long J.
J. Stipules about 3 cm long, leaf-like, rounded at tip; leaflets 2 cm wide, 6 cm long, 5-20 pairs 26. C. nicaraguensis Bth.
J. Stipules 10-12 mm long; leaflets 7-15 pairs; plant a small shrub or tree K.
K. Leaflets 2.5-5 cm wide, 7-10 cm long; stipules lanceolate, usually persistent . . 24. C. reticulata Willd.
K. Leaflets almost 2 cm wide, 2-3.5 cm long; stipules persistent, ovate, heart-shaped at base 25. C. didymobotrya Fresen

- H. Sepals 5-8 mm long; stipules falling early; leaflets 1-2 cm wide, 3-7 cm long, obtuse or retuse, 6-20(-40) pairs; tree L.
- L. Petals pink or white; stipules small; young branchlets densely hairy; pods terete, margined 2. C. grandis L.f.
- L. Petals yellow M.
- M. Pods terete, glabrous, 2 cm thick, up to 5 cm long; stipules triangular, 2-lobed; leaflets up to 1.5 cm wide, 4-5 cm long, 2-20 pairs; branchlets puberulent 3. C. moschata HBK.
- M. Pods flattened, 12-15 mm wide N.
- N. Leaflets 1-2 cm wide, 3-7 cm long, 5-9(-30) pairs; petiolules 3 mm long; petioles 3-5 cm long; pods puberulent 27. C. siamea Lam.
- N. Leaflets up to 1 cm wide, 1-4 cm long, 12-40 pairs; petiolules 2 mm long; petioles 1-2 cm long; 28. C. multijuga Rich
- G. Leaflets 1-5 pairs O.
- O. Plant a tree or shrub; leaflets 2-10 cm long, densely hairy beneath P.
- P. Branches without spines; pod 8-12 mm wide; leaflets 1-5 pairs 41. C. emarginata L.
- P. Branches with spines; pods 15 mm wide; leaflets 2-3 pairs.... 5. C. petensis (B. & R.) Standley
- O. Plant an herb; leaflets blunt or retuse Q.
- Q. Leaflets 4-5 pairs, 0.5-2.5 cm long; stem with dense white spreading hairs 48. C. pilosa L.
- Q. Leaflets 1-2 pairs, 0.5-20 cm long, blunt; stem sticky R.
- R. Leaflets 1 pair; pod flat, 3-5 mm wide, 1.5-4 cm long; pedicels surpassing leaves. 47. C. rotundifolia Pers.
- R. Leaflets 2 pairs, stem with long or short hairs S.
- S. Leaflets glabrous, 1-2 cm long; pod compressed, 5-7 mm wide..... 61. C. hispidula Vahl
- S. Leaflets hairy, at least beneath; pods 5-8 mm wide T.
- T. Petals 5-7 mm long; stamens 5 or 7; leaflets 2-3 cm long; pods 4-6 mm wide, 2.5-4.5 cm long, with long spreading hairs 60. C. Absus L.
- T. Petals 10-15 mm long; stamens 9-10; sepals hairy U.
- U. Sepals acute; flower-buds pointed; pods 4-5 cm long, setulose-hirsute 11. C. Rosei Standley
- U. Sepals very blunt; flower-buds rounded at tip; pods 2.5 cm long, with long spreading hairs 62. C. Killippii Rose
- A. Petiole or axis of leaf bearing 1 or more glands V.
- V. Gland below lowermost leaflets W.
- W. Leaflets 10-50 pairs, 1.5-3 mm wide, 8-18 mm long; in C. nicoyana, gland uncertain; herbs except slightly shrubby C. flavicoma X.
- X. Gland sessile or nearly so, depressed; leaflets 10-50 pairs Y.

- Y. Flowers on internodes; leaflets hairy, 3 mm wide, up to 13 mm long, 10-25 pairs; hairs swollen at base . . . 58. C. patellaria DC.
- Y. Flowers in axils of leaves; leaflets 4-8 mm long, conspicuously veined Z.
- Z. Peduncles 1-2.5 cm long; flowers mostly solitary; leaflets 1-1.5 mm wide, glabrous or hairy, obtuse or acute, 15-50 pairs; stipules 5-15 mm long, heart-shaped. . . . 50. C. flexuosa L.
- Z. Peduncles very short; leaflets glabrous, sometimes ciliate, obtuse, mucronate, 15-25 pairs; stipules 10-15 mm long, not heart-shaped 59. C. simplex (Standley) Standley
- X. Gland narrowed at base or on a stem; stipules small, usually very narrow, not heart-shaped; leaflets 6-25(-40) pairs a.
- a. Stem of gland very short and thick; leaflets 10-20 pairs, 7-12 mm long b.
- b. Leaflets copiously pilose beneath with long appressed hairs, 10-16 pairs 55. C. mayana Lundell
- b. Leaflets glabrous beneath or nearly so, 2-2.5 mm wide, 10-20 pairs 56. C. stenocarpoides (Britton) Lundell
- a. Stem of gland long; gland elongate; leaflets 1.5-3 mm wide, 6-18 mm long, 10-25(-40) pairs c.
- c. Peduncles 1-1.5 cm long; petals 12-15 mm long; sepals 9-10 mm long 51. C. Seleri (Rose) Lundell
- c. Peduncles 4-8 mm long d.
- d. Hairs of pod dense, long, spreading; stem pilose e.
- e. Leaflets 10-25 pairs; stipules 10-14 mm long; pods 4 mm wide, 2.5-5 cm long, pilose 52. C. stenocarpa Vogel
- e. Leaflets 7-13 pairs; pods 3 mm wide, 1.5-2 cm long, long-villous 53. C. nicoyana (Britton) Standley
- d. Hairs of pod sparse, short, appressed; leaflets 1.5-3 mm wide, 1-sided at base f.
- f. Leaflets glabrous, 6-13 pairs; stem pilose; herb; stipules 4-8 mm long; stem of gland long; annual 54. C. Wilsonii (B. & R.) Standley
- f. Leaflets appressed-hairy beneath, up to 30 pairs; gland on stem; small shrub. 57. C. flavicomma HBK.
- W. Leaflets 1-9 pairs g.
- g. Leaflets 1-3 pairs; flowers single, axillary h.
- h. Leaflets 1 pair, 1-3 cm long; plant glabrous; pods 5-6 mm wide, 3-5 cm long; herb 43. C. diphylla L.
- h. Leaflets 2-3 pairs i.
- i. Leaflets 2-5 mm wide, 5-10 mm long, 2-3 pairs; gland on stem; pods about 1 cm long; herb 45. C. Tagera L.
- i. Leaflets 5-9.2 mm wide, 1-3.5 cm long; pods 4-10 cm long j.
- j. Leaflets 3 pairs, 2-3.5 cm long; peduncles shorter than leaves; pods about 10 mm wide, including wings; gland

- lengthened; plant glabrous throughout or nearly so; annual
 19. C. pentagonia Miller
- j. Leaflets 2 pairs; shrub or shrub-like; hairs of young stems
 spreading to ascending k.
 k. Peduncles shorter than leaves; gland sessile.
 44. C. tetraphylla Desv. var. aurivilla Irwin
 k. Peduncles longer than leaves; gland depressed, stem spreading-
 hairy. 46. C. Bartlettii Standley
- g. Leaflets 4-9 pairs; plant an herb; pods flattened 1.
 1. Peduncles few- to several-flowered; leaflets 1.5-9 cm long, 4-8
 pairs m.
 m. Leaflets hairy above and beneath, 4-10 cm long, sometimes
 glabrous, abruptly acute; stipules 5-9 mm long, falling very
 early; pods 10-30 cm long. 29. C. leptocarpa Bth.
 m. Leaflets glabrous except ciliate margin, acuminate; pods flat-
 tened, 6-9 mm wide, margins thickened n.
 n. Gland globose; larger (upper) leaflets (1.5-) 2-3.5(-4) cm
 wide, 3-6 cm long, 4-5 pairs; petiolules about 2 mm long . .
 30. C. occidentalis L.
 n. Gland elongate, cylindrical; larger leaflets 8-12(-15) mm
 wide, 1.5-6 cm long, 7-8 pairs; petiolules 1 mm long. .
 31. C. ligustrina L.
1. Peduncles 1-flowered; leaflets 0.4-2.5 cm long o.
 o. Peduncles mostly 6 mm long or less; leaflets 6-13 pairs, 8-12
 mm long; gland long-stemmed.
 54. C. Wilsonii (B. & R.) Standley
 o. Peduncles longer than leaves; leaflets 4-9 pairs p.
 p. Stem densely pilose with long spreading hairs; leaflets 5-25
 mm long; gland short-stemmed, sometimes lacking
 48. C. pilosa L.
 p. Stem usually incurved-puberulent; leaflets 4-8 mm long;
 gland slender-stemmed. 49. C. serpens L.
- V. Gland(s) between leaflets, usually between lowest pair, sometimes
 between other pairs also q.
 q. Leaflets acute or acuminate r.
 r. Leaflets 3-6 pairs, 2-9 cm long s.
 s. Pods almost terete, 6-9 cm long, 1 cm thick; plant glabrous
 throughout; leaflets long-acuminate, 3-4 pairs; shrub or
 small tree 13. C. laevigata Willd.
 s. Pods compressed or flat t.
 t. Axis of leaves and plant elsewhere hirsute; pods 4-5 mm
 wide, 6-10 cm long; leaflets acute, 3 pairs; herb
 33. C. cobanensis (Britton) Lundell
 t. Axis of leaves puberulent or sparsely hairy; pods 16-18
 cm long; shrub or tree u.
 u. Pods 8 mm wide, short-stipitate; leaflets 3-4 pairs,
 1.5-5 cm long; tree; doubtful, tentative place
 65. C. verbenensis (Britton) Standley

- u. Pods 5-6 mm wide, long-stipitate; leaflets 4-6 pairs, 2-9 cm long, acuminate. 39. C. Tonduzii Standley
- r. Leaflets 2 pairs, up to 18 cm long; shrub or tree v.
- v. Leaflets abruptly acute, 7-9 cm wide, 15-18 cm long; veins much raised beneath w.
- w. Fertile stamens 4; upper pair of leaflets only slightly 1-sided at base; petiole 2-4 cm long; leaflets puberulent-tomentulose beneath with raised hairs; sepals up to 8 mm long; petals 1.5 cm wide, 2 cm long. 7. C. Maxonii (B. & R.) Schery
- w. Fertile stamens 7; veins of leaflets raised at least beneath x.
- x. Petiole 12 cm long; hairs of leaflets beneath tomentulose with raised hairs; sepals 5-8 mm long; petals 1 cm wide, 2-3 cm long; leaflets 1-sided at base 8. C. oxyphylla Kunth
- x. Petiole 2-6 cm long; stem zigzag; hairs of leaflets beneath short, appressed; sepals up to 13 mm long; petals 2 cm wide, 1.5-3 cm long; leaflets slightly or very 1-sided at base 9. C. fruticosa Miller
- v. Leaflets long-acuminate, up to 11 cm long y.
- y. Floral bracts 8 mm long or longer; petioles up to 5 cm long; a gland between each pair of leaflets. 12. C. undulata Bth.
- y. Floral bracts about 2 mm long z.
- z. Leaflets up to 4 cm wide, 9 cm long; petiole 2.5 cm long 16. C. unica Schery
- z. Leaflets up to 7 cm wide, 25 cm long; petiole about 10 cm long. 10. C. caudata Standley
- q. Leaflets obtuse or retuse, sometimes mucronate A.
- A. Leaflets 12-40(-60) pairs, 1.5-10 mm wide; shrub or small tree B.
- B. Leaflets 9-10 mm wide, 1-4 cm long; pods 1.5 cm wide, up to 20 cm long 28. C. multijuga Rich.
- B. Leaflets 1.5-3 mm wide, 8-15 mm long; pods 4-5 mm wide, 9-14 cm long C.
- C. Hairs of upper stem very fine (puberulent); stem elsewhere glabrous; leaflets 20-30 pairs, about 3 mm wide. 37. C. foliolosa Bth.
- C. Hairs of stem 7-9 mm long, spreading, sometimes lacking; leaflets 12-60 pairs, glabrous, mostly 1.5-3 mm wide; gland long-stemmed 38. C. Williamsii (B. & R.) Standley
- A. Leaflets 2-10 pairs D.
- D. Leaflets densely yellowish-tomentose beneath, 6-8 pairs, 1-5 cm long; petals 12-15 mm long; pod densely hairy, 7 mm wide; shrub or tree. 17. C. tomentosa L. f.
- D. Leaflets not densely tomentose beneath E.
- E. Pods present F.
- F. Pods thick, not compressed; peduncles axillary; herb except sometimes C. bicapsularis G.

- G. Pods 4-4.5 cm long, straight, with valley between seeds; leaflets 4 pairs, 2-5 cm long, hairy beneath; stem with appressed hairs below, ascending hairs above; annual . . . 23. C. uniflora Miller
- G. Pods 8-20 cm long, without valleys between seeds; leaflets 2-5 pairs, 1-7 cm long H.
- H. Pods 10-15 mm wide or thick, margins not thickened; plant woody I.
- I. Sepals 8-12 mm long; leaflets 1-4 cm long, 3-5 pairs; pedicels 3-8 mm long; plant glabrous throughout or nearly so 14. C. bicapsularis L.
- I. Sepals 6-8 mm long; leaflets 2 pairs, upper pair 6-9 cm long; pedicels 1-2 cm long; twigs puberulent 15. C. Rowleeana (B. & R.) Standley
- H. Pods 2-5 mm wide, 8-20 cm long; herb J.
- J. Pods 2-3 mm wide, 8-16 cm long, margins not thickened; leaflets 2 pairs, 2-7 cm long, sparsely pilosulous beneath; stem with spreading hairs; sepals 6-10 mm long. 20. C. pilifera Vogel
- J. Pods 3-5 mm wide, (11-)15-20 cm long, margins thickened, much curved; leaflets 2-4 pairs, 1.5-5 cm long, glabrous beneath, less often hairy beneath; stem glabrous or nearly so; sepals 5-8 mm long; gland slender. . . 18. C. obtusifolia L.
- F. Pods flat or compressed K.
- K. Leaflets glabrous beneath or nearly so; pedicels 1-2 cm long; sepals 4-9 mm long; stipules linear to awl-like; shrub or tree L.
- L. Leaflets 2-3 pairs, 2-4.5 cm long; stem glabrous; gland long; pods 4 mm wide, 8-12 cm long. . . . 36. C. Holwayana Rose
- L. Leaflets 4-10 pairs, 1-3 cm long; stem hairy or glabrous 34. C. biflora L.
- K. Leaflets distinctly hairy beneath, at least on veins; petals 1.5-3 cm long M.
- M. Pods 8-12 mm wide; leaflets 4-8 pairs, 2-5 cm long; shrub or small tree N.
- N. Pods 8-10 mm wide; petals 2.5-3 cm long; pods narrowed between seeds 22. C. Skinneri Bth.
- N. Pods 12 mm wide; petals 6-8 mm long; sepals 4-8 mm long 40. C. guatemalensis Donn. Smith
- M. Pods 3-6 mm wide, 8-12 cm long O.
- O. Petals 2-3 cm long; pods 3-4 mm wide; leaflets 2-5 or more pairs, 1-3.5 cm long; pedicels 1-2 cm long; shrub or small tree 63. C. xiphoidea Bertol.

O. Petals 1.5-2 cm long P.

P. Leaflets 3 pairs, 2-5 cm long; petals 1.5-2 cm long; pods 3-6 mm wide, much curved; pedicels 2-5 cm long; herb or woody at base 32. C. leiophylla Lundell

P. Leaflets 6-10 pairs, 1-2 cm long; petals 1.5 cm long; pods 5-6 mm wide; shrub 35. C. longirostrata (B. & R.) Lundell

E. Pods absent Q.

Q. Pedicels 3-8 mm long; leaflets 2-5 pairs R.

R. Stem glabrous or nearly so S:

S. Sepals 5-8 mm long; annual; leaflets 2-4 pairs, 1.5-5 cm long, usually glabrous but sometimes hairy beneath; herb 18. C. obtusifolia L.

S. Sepals 8-12 mm long; stem woody at base; leaflets 3-5 pairs, 1-4 cm long; plant glabrous throughout or nearly so 14. C. bicapsularis L.

R. Stem very hairy; herb T.

T. Leaflets 2 pairs, sparsely pilosulose beneath, 2-7 cm long; hairs of stem long, spreading; sepals 6-10 mm long 20. C. pilifera Vogel

T. Leaflets 4 pairs, hairy beneath, 2-5 cm long; hairs of stem appressed below, ascending above; sepals 6 mm long 23. C. uniflora Miller

Q. Pedicels 1-5 cm long; sepals 4-9 mm long; leaflets 2-10 pairs U.

U. Plant an herb or woody at base; leaflets 3 pairs, 2-6 cm long; stipules 12-16 mm long, persistent; petals 1.5-2 cm long; pedicels 2-5 cm long; sepals 8 mm long or less; herb or woody at base 32. C. leiophylla Vogel

U. Plant a shrub or tree; stipules linear or setaceous, falling early except perhaps in C. xiphoidea; pedicels 1-2 cm long; shrub or small tree V.

V. Axis of leaves and leaflets beneath glabrous or nearly so W.

W. Leaflets 2-3 pairs, 2-4.5 cm long; stem glabrous; petals 2-2.5 cm long 36. C. Holwayana Rose

W. Leaflets 4-10 pairs, 1-3 cm long; stem hairy or glabrous; petals 2 cm long 34. C. biflora L.

V. Axis of leaves and leaflets at least sparsely hairy beneath especially on veins X.

X. Petals 6-8 mm long; sepals 4-8 mm long; leaflets 4-8 pairs, 3-5 cm long 40. C. guatemalensis Donn. Smith

X. Petals 1.5-4 cm long Y.

Y. Petals 1.5 cm long; sepals 6-8 mm long Z.

Z. Leaflets densely hairy beneath, 1-2 cm long, 6-10 pairs; hairs silky . . 35. C. longirostrata (B. & R.) Lundell

Z. Leaflets 2 pairs, upper pair 6-9 cm long 15. C. Rowleeana (B. & R.) Standley

Y. Petals 2-4 cm long; hairs of leaves not silky, usually sparse beneath a.

- a. Leaflets 1-3.5 cm long, 2-5 pairs or more, sparsely or densely hairy beneath; pedicels 1-2 cm long. 63. C. xiphoidea Bertol.
- a. Leaflets 2-5 cm long, 4-7 pairs, pilose beneath at least on veins; pedicels long; petals 2.5-3 cm long; 22. C. Skinneri Bth.

Abbreviations used which are not in common use.

B. & R., Britton & Rose	S. A., South America
Bth., Bentham	SEY, private herbarium of Frank C. Seymour
M. & G., Martens & Galeotti	WDP, Herbarium of St. Norbert College, West De Pere, Wis.
ENAG, Herbarium of the Escuela Nacional de Agricultura y Ganaderia, Managua, Nicaragua	W. I., West Indies
MHV, Maxon, W. R., Harvey, A. D. & Valentine, A. T., collectors	WMWGL, Williams, L. O., Molina, A. R., Williams, T. P., Gibson, D. N. & Laskowski, Chester, collectors

ANNOTATED SYSTEMATIC LIST

With notes on species found in Central America but not known in Nicaragua.

The order of species followed is that of the Harvard Herbaria with occasional insertions.

To assist the reader to obtain further information, the reference is given to the original description or to the place where the combination here used was published.

A few synonyms are given in cases where they were involved in writing this article.

An asterisk * before a name indicates that the species is not indigenous.

- * 1. C. Fistula L., Sp. Pl. 377. 1753. Fla. (cult.) (FLAS), Mex. (GH), Guatemala (cult.), W. I. Introduced from tropical Asia. Nicaragua, Chinandega, Dept. Chinandega, Baker 2287 (GH).
2. C. grandis L.f., Suppl. Pl. 230. 1781. s. Mex. to Panama, W. I., n. S. A. Nicaragua, Granada, Dept. Granada, Baker 113 (GH).
3. C. moschata HBK., Nov. Gen. & Sp. 6:338. 1824. Mex., British Honduras, Costa Rica, Panama. Nicaragua, La Virgen, Dept.

- Rivas, Narvaez 1215 (GH); Hamblett 1406 (ENAG, SEY, MO).
4. C. spectabilis DC., Cat. Hort. Monsp. 90. 1813. s. Mex. to Panama, W. I., n. S. A.
 5. C. petensis (B. & R.) Standley, Carnegie Inst. Wash. Publ. 461: 61. 1935. This species and C. anisopetala are easily recognized by the spines. British Honduras, Guatemala.
 6. C. anisopetala Donn. Smith, Bot. Gaz. 37:209. 1904. Guatemala. Isotype: Guatemala, Cubilquitz, Dept. Verapaz, alt. 350 m, May 1902, Tuerckheim 8194 (GH).
 7. C. Maxonii (B. & R.) Schery, Ann. Mo. Bot. Gard. 38:77. 1951. Mex., Central America, n.S. A., Synonym: Chamaefistula Williamsii B. & R., N. Amer. Fl. 23:236. 1930; non Peiranisia Williamsii B. & R., N. Amer. Fl. 23:265. 1930. Type: Maxon & Harvey 6611. Characterized by 4 large fertile stamens. Hairs on leaflets beneath short, curly, whereas in C. fruticosa and C. undulata, hairs on leaflets beneath are puberulent.
 8. C. oxyphylla Kunth, Mimos. 129. t. 39. 1819.
 - a. Petals shorter, wider var. oxyphylla
 - a. Petals longer, narrower, up to 2.3 cm long, 1 cm wide var. dariensis
 Var. oxyphylla. Mex. to Panama. This variety probably not in Panama.
 Var. dariensis. (B. & R.) Schery, Ann. Mo. Bot. Gard. 38:79. 1951. Panama. Doubtfully distinct from var. oxyphylla.
 9. C. fruticosa Miller, Gard. Dict. ed. 8, no. 10. 1768. Cassia bacillaris L.f., Suppl. Pl. 231. 1781. Chamaefistula Valerioi B. & R., N. Amer. Fl. 23:236. 1930. Stem zigzag. Fertile stamens 7.
 - a. Leaflets, especially upper pair, very 1-sided at base; sepals 6-13 mm long; petals 1.3-2 cm long var. fruticosa
 - a. Leaflets only slightly 1-sided at base; sepals up to 10 mm long; petals up to 2.5 cm long, longer and narrower than in var. fruticosa var. gatunensis
 Var. fruticosa. Mex. to Brazil.

Nicaragua, Siuna, Dept. Zelaya, Atwood 3176 (ENAG, SEY, SMU, BM, GH, F, MO, UC): Seymour 3198 (WDP, MICH).
 Madregava, Dept. Zelaya, Seymour 3265 (VT).
 Santo Tomas, Dept. Chontales, Nichols 277a (MO).
 Tipitapa, Dept. Managua, Narvaez 13 (ENAG, SEY, SMU, GH, MO).
 San Juan del Norte, Dept. Rio San Juan, Smith 89 (GH).

 Var. gatunensis (Britton) Schery, Ann. Mo. Bot. Gard. 38:81. 1951. Panama.
 10. C. caudata Standley, Contr. U. S. Nat. Herb. 18:102. 1916. Costa Rica, Panama.
 11. C. Rosei Standley, Field Mus. Bot. 11:159. 1936. Mex., Guatemala, Honduras (FLAS).

12. C. undulata Bth., in Hooker, Journ. Bot. 2:76. 1840. s. Mex., British Honduras, Guatemala, Panama, n. S. A.
Nicaragua, a lo largo del Rio Grande, alt. 0.15 m, Dept. Zelaya, Molina 2490 (GH); Bluefields, Molina 1926 (GH)
Chemical Plant, Comarca del Cabo, Seymour 5601 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY).
San Carlos, Dept. Rio San Juan, Atwood 2030a (SEY).
13. C. laevigata Willd., Sp. Pl. 441. 1809. Fla. (FLAS), Mex., Guatemala, Honduras, Salvador, Panama. Much like C. occidentalis.
14. C. bicapsularis L., Sp. Pl. 376. 1753.
a. Plant glabrous throughout or nearly so; lowermost lateral stamens short-beaked; beak 1 mm long or less
. var. bicapsularis
a. Upper twigs and lower leaf-surface usually puberulent;
lowermost lateral stamens long-beaked; beak 1-2 mm long
. var. pubescens Bth.
Var. bicapsularis. Mex. to Panama, W. I., S. A.
Nicaragua, Managua, Dept. Managua, Garnier 3090 (A).
Chinandega, Dept. Chinandega, Baker 4 (A, GH).
Var. pubescens Bth., Trans. Linn. Soc. 27:525. 1871.
C. indecora HBK., Nov. Gen. & Sp. 6:344. 1824.
Mex. to Panama, W. I., S. A.
15. C. Rowleeana (B. & R.) Standley, Field Mus. Bot. 18:517. 1937.
Chamaefistula Rowleeana B. & R., N. Amer. Fl. 23:234. 1930.
Endemic. Costa Rica.
16. C. unica Schery, Ann. Mo. Bot. Gard. 38:76. 1951. w Panama.
Type coll. 1911. Collected only once.
17. C. tomentosa L.f., Suppl. Pl. 231. 1781. s. Mex., Guatemala, w. & s. S. A.
18. C. obtusifolia L., Sp. Pl. 377. 1753. s. U.S., Mex. to Panama, W. I., S. A. Distinct from C. Tora L., Sp. Pl. 376. 1753, with which it has commonly been confused as Dr. Daniel B. Ward kindly called to my attention. Leaflets 3 pairs, with long appressed hairs beneath. Pods 3-5 mm wide, 15-20 cm long, much curved. Gland between leaflets. Pedicels 2-2.5 cm long in flower, 2.5-3.5 cm long in fruit. See note under C. pentagonia.
Nicaragua, Siuna, Dept. Zelaya, Seymour 3150 (VT).
Sebaco, Dept. Matagalpa, Seymour 2536 (VT).
Tipitapa, Dept. Managua, Seymour 2343 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH).
Granada, Dept. Granada, Hamblett 1110 (ENAG, SEY, MO).
19. C. pentagonia Miller, Gard. Dict. ed. 8, no. 18. 1768. Guatemala, Honduras, Brazil. Gland below lowermost leaflets. Pods 1 cm wide, 5-10 cm long, only slightly curved. Sometimes confused with C. obtusifolia, q.v. In Fl. Panama, Ann. Mo. Bot. Gard., C. pentagonia is treated as a synonym of C. Tora L. The chara-

- acters here given seem to make it clearly distinct from C. obtusifolia.
20. C. pilifera Vogel, Syn. Cass. 23. 1837. s. Mex. to Panama, Cuba, S. A. Stem with long spreading hairs. Peduncles 2-4-flowered. Pods 3.5-4 mm wide. 14-17 cm long. Cp. C. Williamsii.
21. C. alata L., Sp. Pl. 378. 1753. Fla. (cult.) (FLAS), s. Mex. to Panama., W. I., S. A., Old World tropics. "In general appearance it is exactly like C. reticulata but the pods of the two species are, of course, very unlike." Fl. Guatamala, Field Mus. Bot. 24: part 5: 109. 1946.
Nicaragua, Teustepe, Dept. Boaco, Seymour 2452 (ENAG, SEY, GH, MO).
Limbaykan, Dept. Zelaya, Nelson 4898 (ENAG, SEY, MO).
Bluefields, Dept. Zelaya, Molina 1978 (GH); Atwood & Moore 356 (SEY, GH, MO)
San Carlos, Dept. Rio San Juan, Atwood 2031 (ENAG, SEY, SMU, BM, MO).
22. C. Skinneri Bth., Trans. Linn. Soc. 27: 542. 1871. s. Mex., Guatemala, Honduras, Salvador.
23. C. uniflora Miller, Gard. Dict. ed. 8, no. 5. 1768. C. sericea Sw., Prodr. Ind. Occ. 66. 1788. Mex, British Honduras, Guatemala, Honduras, Salvador, W. I., Venezuela, Galapagos Is. Nicaragua, Potrerillos, Dept. Boaco, Seymour 2358 (SEY, MO).
San Francisco, Dept. Boaco, Robbins 6046 (ENAG, SEY).
Tecolostate, Dept. Boaco, Salas & Taylor 3530 (ENAG).
Teustepe., Dept. Boaco, Seymour 2453 (VT).
Managua, Dept. Managua, Garnier 4031 (GH).
Tipitapa. Dept. Managua, Zelaya 49 (BM); Atwood 2815 (SEY, SMU, GH, MO).
Granada, Dept. Granada, Moore 1119 (SEY, MO):
Nichols 1132 (ENAG, SEY, SMU, BM, GH, F, MO).
24. C. reticulata Willd., Enum. Pl. 443. 1809. Mex., British Honduras to Panama (FLAS), S. A.
Nicaragua, no precise locality, Wright (GH)
Lake Managua, Grant 1131 (A).
Masaya, Dept. Masaya, Zelaya 151 (ENAG, SEY, SMU, BM, GH, F, MO, UC.).
Granada, Dept. Granada, Baker 142 (GH), 41 (GH); Grant 899 (A).
- *25. C. didymobotrya Fresen, Flora 22: 53. 1839. Guatemala, Honduras (GH), Costa Rica, Canal Zone.
Introduced from tropical Africa.
26. C. nicaraguensis Bth., Trans. Linn. Soc. 27: 552. 1871. s. Mex. to Panama.
Nicaragua, Esteli, Dept. Esteli, alt. 850 m, Williams & Molina 10944 (GH).

- *27. C. siamea Lam., Encycl. 1:648. 1785. General in tropical America. Introduced from East Indies.
Nicaragua, Matagalpa, Dept. Matagalpa, Zelaya 2308 (SEY)
Managua, Dept. Managua, Robbins 6089 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH).
28. C. multijuga Rich., Act. Soc. d'Hist. Nat. Paris 1:108. 1792. Mex. to Panama, n. S. A. "Often cultivated in Panama." Petiole usually but not always bearing an elongate gland between lowermost leaflets.
29. C. leptocarpa Bth., Linnaea 22:528. 1849. Similar to C. ligustrina L. and C. occidentalis L. Leaflets attenuate. Photo of type (A).
a. Branches, leaves, pedicels, pods and sepals glabrous or glabrate var. leptocarpa
a. Branches, leaves, pedicels, pods and sepals hairy var. hirsuta Bth.
Var. leptocarpa. s. Mex., Guatemala, Honduras, Salvador, Costa Rica, Cuba, S. A.
Var. hirsuta Bth., Trans. Linn. Soc. 27:531. 1871.
Panama.
Nicaragua, Masaya, Dept. Masaya, Nichols 124a (SEY).
30. C. occidentalis L., Sp. Pl. 377. 1753. C. Sophora L., Sp. Pl. 379. 1753. s. U. S., Mex. to Panama, W. I., S. A.
Nicaragua, a lo largo del Rio Grande, Molina 2485 (GH)
Jalapa, Dept. Nueva Segovia, Robbins 5488 (SEY)
Yalaguina, Dept. Madriz, Seymour 956 (SEY, MO)
Momotombo, Dept. Leon, Smith 130 (GH)
Managua, Dept. Managua, Seymour 2626 (SEY)
Lake Nejapa, vic. Managua, MHV 7551 (GH)
Tipitapa, Dept. Managua, Hamblett 8 (VT)
San Francisco, Dept. Boaco, Robbins 6047 (SEY)
Teustepe, Dept. Boaco, Atwood & Seymour 2418 (SEY, SMU, GH, MO)
Corn Island, Dept. Zelaya, Seymour 4406 (SEY, MO)
Punto Mico, Dept. Zelaya, Nelson 4246 (SEY, GH, MO)
Granada, Dept. Granada, Seymour 1155a (VT)
31. C. ligustrina L., Sp. Pl. 378. 1753. Fla. (FLAS), Panama, W. I.
32. C. leiophylla Vogel, Syn. Cass. 25. 1837. Mex., British Honduras, Guatemala, Salvador, Costa Rica, Panama to Brazil.
Nicaragua, Waspan, Comarca del Cabo, Atwood 3556 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP); Seymour 3581 (MICH)
Siuna, Dept. Zelaya, Seymour 3013 (VT);
Siuna, Dept. Zelaya, Seymour 3197 (ENAG, SEY, SMU, BM, GH, F, MO)
Corn Island, Dept. Zelaya, Atwood 4392 (VT)
Bluefields, Dept. Zelaya, Seymour 705 (VT)

- El Recreo, Dept. Zelaya, Narvaez 462 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, MICH)
- Jalapa, Dept. Nueva Segovia, Robbins 5487 (ENAG, SEY)
- Santo Domingo, Dept. Chontales, Seymour 3392 (VT)
- Santo Tomas, Dept. Chontales, Nichols 277 (VT)
- Santo Tomas, Dept. Chontales, Atwood 2725 (ENAG, SEY, MO)
- Masaya, Dept. Masaya, Nichols 124a (SEY, MO)
- San Carlos, Dept. Rio San Juan, Atwood 2030b (NY, WDP)
- San Carlos, Dept. Rio San Juan, Hamblett 2058 (VT)
- Penas Blancas, Dept. Rivas, Seymour 1858 (SEY, MO)
33. C. cobanensis Lundell, Phytologia 1: 214. 1937. Guatemala. Known only from the type. Type: Coban, Alta Vera Paz, Tuerckheim 2056.
34. C. biflora L., Sp. Pl. 378. 1753.
C. pallidior Rose, Journ. Wash. Acad. Sci. 17: 167. 1927. Mex. to Panama, W. I., n. S. A.
Nicaragua, Chinandega, Dept. Chinandega, Baker 125 (GH)
 El Viejo, Dept. Chinandega, Atwood 2638 (SEY, GH, MO)
 Casas Viejas, Dept. Matagalpa, Nichols 1060 (ENAG, SEY, SMU, BM, GH, F, MO, UC)
 Sebaco, Dept. Matagalpa, Narvaez 2526a (SEY, GH, MO)
 Boaco, Dept. Boaco, Seymour 5425 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH)
 Camoapa, Dept. Boaco, Atwood 3467 (SEY, SMU, GH, MO)
 Managua, Dept. Managua, Garnier 3079 (A), 4273 (A)
 Granada, Dept. Granada, Grant 911 (A)
 Ometepe, Dept. Rivas, Smith s. n. (GH)
 Penas Blancas, Dept. Rivas, Moore 1827 (GH); Nichols 1843 (ENAG, SEY, MO)
 La Virgen, Dept. Rivas, Hamblett 1190 (ENAG, SEY, UC)
 San Juan del Sur, Dept. Rivas, Narvaez 1255 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH)
35. C. longirostrata (B. & R.) Lundell, Phytologia 1: 214. 1937. Guatemala (GH).
36. C. Holwayana Rose, Contr. U. S. Nat. Herb. 8: 301. 1905. s. Mex., Guatemala, Honduras, Salvador.
37. C. foliolosa Bth., Trans. Linn. Soc. 27: 544. 1811. Guatemala. Leaflets about 3 mm wide, 8-12 mm long, 20-30 pairs.
38. C. Williamsii (B. & R.) Standley, Field Mus. Bot. 18: 519. 1937. Peiranisia Williamsii B. & R., N. Amer. Fl. 23: 265. 1930. non Chamaefistula Williamsii B. & R., N. Amer. Fl. 23: 236. 1930.
 Costa Rica, Panama. Similar to C. pilosa in having long white hairs.
39. C. Tonzuzii Standley, Contr. U. S. Nat. Herb. 20: 215. 1919. Chiapas, Costa Rica.

40. C. guatemalensis Donn. Smith, Bot. Gaz. 2:6. 1897.
Guatemala, Honduras, Salvador, Costa Rica.
Nicaragua, Santa Lastenia, Dept. Jinotega, alt. 1500 m,
WMWGL 27853 (GH).
41. C. emarginata L., Sp. Pl. 376. 1753. Mex. to Costa Rica,
W. I., n. S. A. Branchlets densely pilosulous or tomentose.
Leaves eglandular.
Nicaragua, Lake Masaya, Dept. Masaya, alt. 300 m, Maxon
7734 (GH).
42. C. xanthophylla (B. & R.) Lundell, Phytologia 1:215. 1937.
Reported from Guatemala but probably incorrectly. Known
only from the type: Casillas, Santa Rosa, 1300 m, Heyde &
Lux 4471.
43. C. diphylla L., Sp. Pl. 376. 1753. s. Mex. to Brazil, W. I.,
Philippines. If the very small gland should be obscured, this
species might be confused with C. rotundifolia Pers. They can
be distinguished by the following characters.
- A. Stem glabrous; petiole 5-6 mm long; stipules up to 15 mm
or more long; longest sepals up to 10 mm long
. C. diphylla L.
- A. Stem hairy to almost glabrous; petiole not exceeding
stipules; stipules up to 10 mm long; sepals up to 5 mm long
. C. rotundifolia Pers.
- Nicaragua, Bilwaskarma, Comarca del Cabo, Nelson 4631 (VT)
Puente Pozo Azul, Comarca del Cabo, Seymour 4591 (SEY,
GH, MO)
Waspan, Comarca del Cabo, Atwood 3617 (VT); Seymour
3684 (GH, MO)
Limbaikan, Dept. Zelaya, Nelson 4899 (SEY, MO)
Puerto Isabel, Dept. Zelaya, Atwood & Seymour 2951
(ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP,
MICH)
Puerto Cabezas, Dept. Zelaya, Nelson 4532 (SEY, MO)
Tamlá, near Puerto Cabezas, Dept. Zelaya, Seymour
5998 (SEY).
44. C. tetraphylla Desv., Journ. Bot. III, 72. 1814.
var. aurivilla Irwin, Mem. N. Y. Bot. Gard. 12:96-99. 1964.
C. brevipes DC. Collad. Hist. Cass., 19. 1816.
non C. tetraphylla Desv. var. brevipes (Bth.) Irwin. Fruiting
peduncles shorter than leaves. Pods 10-14 mm wide, 2.4-
3.6 mm long, with long appressed hairs.
British Honduras, Honduras, Costa Rica, Panama (FLAS).
Nicaragua, La Esperanza, Dept. Zelaya, Rio Grande, Molina
2146 (F)
Limbaikan, Dept. Zelaya, Seymour 4982 (ENAG, SEY, SMU,
BM, GH, F, MO, UC, NY, WDP, MICH)

45. C. Tagera L., Sp. Pl. 376. 1753. s. Mex. to Panama, S. A. Glands on petiole minute. Stipules wide at base, heart-shaped. Nicaragua, Bihmona, Comarca del Cabo, Seymour 5719 (VT) Waspan, Comarca del Cabo, Seymour 3683 (SEY). Puerto Isabel, Dept. Zelaya, Atwood 2952 (SEY, SMU, GH, MO).
46. C. Bartlettii Standley, Field Mus. Bot. 11:132. 1932. British Honduras, Guatemala. Isotype: British Honduras, El Cayo Dist., Mountain Pine Ridge, 21 Feb. 1931, Bartlett 11649 (GH).
47. C. rotundifolia Pers., Syn. 1:456. 1805. Fla. (FLAS), Mex. to Brazil. No specimen seen from Nicaragua or Guatemala. See note under C. diphylla
48. C. pilosa L., Syst. ed. 10. 1017. 1759. Similar to C. Williamsii in having long white hairs. Fla. (FLAS), Chiapas, Guatemala, Salvador, Costa Rica, W. I., n. S. A.
49. C. serpens L., Syst. ed. 10. 1018. 1759. Fla. (FLAS), w. Mex., British Honduras, Guatemala, Honduras, W. I., n. S. A. Probably in Nicaragua, Realjo, Sinclair s.n. (GH).
50. C. flexuosa L., Sp. Pl. 379. 1753. s. Mex. British Honduras, Salvador, Panama, Cuba, S. A. Nicaragua, Tamla, Dept. Zelaya, Seymour 5999 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH)
51. C. Seleri (Rose) Lundell, Phytologia 1:215. 1937. Guatemala. Isotype: Guatemala, Barranca del Rio de las Vacar, Solidade Fabal, 15 Oct. 1896, Seler 2286 (GH).
52. C. stenocarpa Vogel, Syn. Cass. 68. 1837. Chamaecrista riparia Britton, non Cassia riparia HBK. Similar to C. flexuosa L. Mex. to Panama, W. I., n. S. A. Nicaragua, Sierras de Managua, Grant 956 (A).
53. C. nicoyana (Britton) Standley, Field Mus. Bot. 18:516. 1937. Chamaecrista nicoyana Britton, N. Amer. Fl. 23:292. 1930. Endemic, Costa Rica. Leaflets 7-13 pairs, but Standley in Flora of Costa Rica, p. 516, says "10-22-jugate."
54. C. Wilsonii (B. & R.) Standley, Field Mus. Bot. 10:219. 1931. British Honduras, Guatemala, Honduras. Type from Tela, Honduras.
55. C. mayana Lundell, Phytologia 1:215. 1937. Chiapas, Guatemala, Honduras, Costa Rica. Chamaecrista Tonduzii B. & R. N. Amer. Fl. 23:290. 1930. non Cassia Tonduzii Standley, Contr. U. S. Nat. Herb. 20:215. 1919.
56. C. stenocarpoides (Britton) Lundell, Phytologia 1:215. 1937. Fla., Guatemala, Costa Rica. Chamaecrista stenocarpoides Britton, in Britton & Rose, N. Amer. Fl. 23:293. 1930. Cassia

- stenocarpa* Vogel var. *stenocarpoides* (Britton) Schery, Ann. Mo. Bot. Gard. 38:60. 1951.
57. *C. flavicomis* HBK., Nov. Gen. & Sp. 6:366. 1824. Mex., Honduras, Panama, W. I., S. A. See Ann. Mo. Bot. Gard. 38:61. 1951. Perhaps *Cassia riparia* HBK., Nov. Gen. & Sp. 6:369. 1824.
58. *C. patellaria* DC., Collad. Hist. Cass. 125. 1816. Fla., Mex., Honduras, Panama.
59. *C. simplex* (Standley) Standley, Contr. U. S. Nat. Herb. 27:199. 1928. *Chamaecrista Browniana* B. & R., N. Amer. Fl. 23:293. 1930. *Cassia Browniana* (B. & R.) Philipson, Mutisia #24, 2. 1956. Guatemala, Panama. Nicaragua, Santo Tomas, Dept. Chontales, Seymour 6307 (SEY, SMU).
60. *C. Absus* L., Sp. Pl. 376. 1753. s. Mex., Guatemala, W. I., S. A., Old World tropics.
61. *C. hispidula* Vahl, Eclog. 3:10. 1807. *C. leiantha* Bth., in Hook. Journ. Bot. 2:78. 1840. s. Mex., Salvador, Costa Rica, Cuba, n. S. A. Nicaragua, Santo Tomas, Dept. Chontales, Nichols 278 (SEY) Casa Colorado, Dept. Carazo, Dudey & Hamblett 512 (SEY).
62. *C. Killippii* Rose, in Standley, Journ. Wash. Acad. Sci. 17:167. 1927. *C. hispidula* Vahl var. *Killippii* (Rose) Schery, Ann. Mo. Bot. Gard. 38:55. 1938. British Honduras, Guatemala, Panama.
63. *C. xiphoidea* Bertol., Fl. Guat. 415. 1840. *Peiranisia Deamii* B. & R., N. Amer. Fl. 23:261. 1930. *Cassia Deamii* (B. & R.) Lundell, Carnegie Inst. Wash. Pub. 478:212. 1937. May be a synonym of *Cassia biflora* L. Chiapas, Guatemala, Honduras. Nicaragua, Casas Viejas, Dept. Matagalpa, Dudey 1032 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP) Nicaragua, Boaco, Dept. Boaco, Nichols 1470 (ENAG, SEY, SMU, GH, F, MO) Potrerillos, Dept. Boaco, Seymour 2356 (VT) Telica, Dept. Leon, Dudey, Hamblett & Nichols 216 (SEY, GH, MO)

Doubtful species

64. *C. Standleyi* (B. & R.) Standley, Field Mus. Bot. 18:518. 1937. Included in the Flora of Costa Rica but with the comment: "probably will be reduced to synonymy." No specimen seen. Endemic. Costa Rica. Field Mus. Bot. 18:518. 1937. *Chamaefistula Standleyi* B. & R., N. Amer. Fl. 23:238. 1930.
65. *C. verbenensis* (Britton) Standley, Field Mus. Bot. 18:519. 1937. *Peiranisia verbenensis* Britton, N. Amer. Fl. 23:266. 1930. Costa Rica, endemic. The original description is inadequate to distinguish this species from some other species in Central

America. The description in Flora of Costa Rica, Field Mus. Bot. 18: 519. 1937., adds little to the original description.

Tree. Leaflets 1.5-3 cm long, 3-4 pairs, acute to obtuse, 1.5-5 cm long, hairy beneath. Pods flat, 6 mm wide, 18 cm long. No specimen seen.

66. C. viscosa HBK., Nov. Gen. & Sp. 6: 360. 1824. Reported in Guatemala but not included in Flora of Guatemala, Field Mus. Bot. 24, part 5, 131. 1946.

This article reports 11 species in Nicaragua of which this writer has seen no specimen other than those collected by him and his companions, 1968-1972. By name:

C. diphylla L.	C. leptocarpa Bth.	C. simplex (Standley)
C. flexuosa L.	C. moschata HBK.	Standley
C. hispidula Vahl	C. obtusifolia L.	C. Tagera L.
C. leiophylla Vogel	C. siamea Lam.	C. xiphoidea Bertol.

Tabular Summary of Species

Collected by others in Nicaragua	16
Added by this writer and his companions	<u>11</u>
Total species here reported in Nicaragua	27
Reported only from elsewhere in Central America	<u>36</u>
Total here reported in Central America	<u>63</u>

Acknowledgments

I acknowledge with thanks the privilege of examining specimens in the following herbaria.

Arnold Arboretum, Harvard University, Dr. Richard A. Howard,
Director

Gray Herbarium, Harvard University, Dr. Reed C. Rollins, Director
Pringle Herbarium, University of Vermont, Dr. H. W. Vogelmann,
Director

Herbarium of the University of Florida, Dr. Daniel B. Ward, Director
Herbarium of the University of South Florida, Dr. Robert W. Long, Director
Herbarium of the Escuela Nacional de Agricultura y Ganaderia, Managua, Nicaragua

Principal publications consulted in preparation of this article.

Britton, N. L. & J. N. Rose, Caesalpiniaceae. North American Flora 23: 231-239. 1930.

- Standley, P. C., Flora of Costa Rica, Field Mus. Bot. 18: 513-519. 1937.
- Standley, P. C. & J. A. Steyermark, Flora of Guatemala, Field Mus. Bot. 24, part 5, 105-132. 1946.
- Woodson, R. E., Jr., & R. W. Schery & Collaborators, Flora of Panama, Ann. Mo. Bot. Gard. 38: 39-83. 1951.
- Irwin, Howard S., Jr., Monographic Studies in Cassia, Section Xerocalyx. Memoirs of N. Y. Bot. Gard. 12, #1, 1964.

Index of species and synonyms mentioned in this article. Numbers refer to species numbers, not pages.

Absus 60	Killippii 62	Seleri 51
alata 21	laevigata 13	sericea 23
anisopetala 6	leiophylla 32	serpens 49
bacillaris 9	leptocarpa 29	siamea 27
Bartlettii 46	ligustrina 31	simplex 59
bicapsularis 14	longirostrata 35	Skinneri 22
biflora 34	Maxonii 7	Sophora 30
brevipes 44	mayana 55	spectabilis 4
Browniana 59	moschata 3	Standleyi 64
caudata 10	multijuga 28	stenocarpa 52
cobanensis 33	nicaraguensis 26	stenocarpoides 56
dariensis 8	nicoyana 53	Tagera 45
Deamii 63	obtusifolia 18	tetraphylla 44
didymobotrya 25	occidentalis 30	tomentosa 17
diphylla 43	oxyphylla 8	Tonduzii 39, 55
emarginata 41	pallidior 34	Tora 17
Fistula 1	patellaria 58	undulata 12
flavicomma 57	pentagonia 19	unica 16
flexuosa 50	petensis 5	uniflora 23
foliolosa 37	pilifera 20	Valerioi 9
fruticosa 9	pilosa 48	verbenensis 65
grandis 2	reticulata 24	viscosa 66
guatemalensis 40	riparia 52, 57	Williamsii 38
hispidula 61	Rosei 11	Wilsonii 54
Holwayana 36	rotundifolia 47	xanthophylla 42
indecora 14	Rowleana 15	xiphoidea 63